

# CHATTANOOGA'S SMART STREETLIGHTS

David Crockett

DOE

Solid State Lighting

Pittsburgh, PA

July 17-19, 2012



LEDs

# Chattanooga's Radio-Operated Streetlamps

Chattanooga

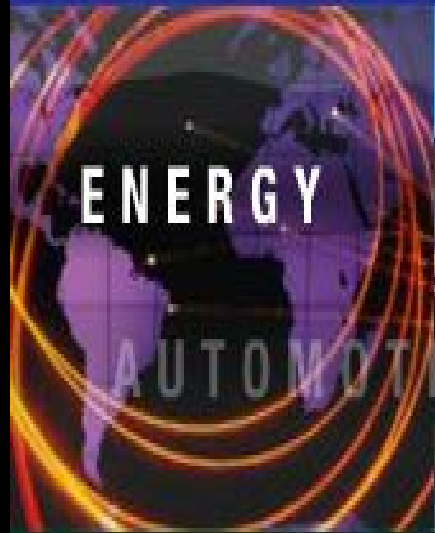
TENNESSEE VALLEY  
CORRIDOR  
AL • KY • NC • TN • VA



*Putting Science and Technology to Work*



HOME SUMMITS & EVENTS VISION INITIATIVES ECONOMIC & TECHNOLOGY DEVELOPMENT COMMUNICATIONS







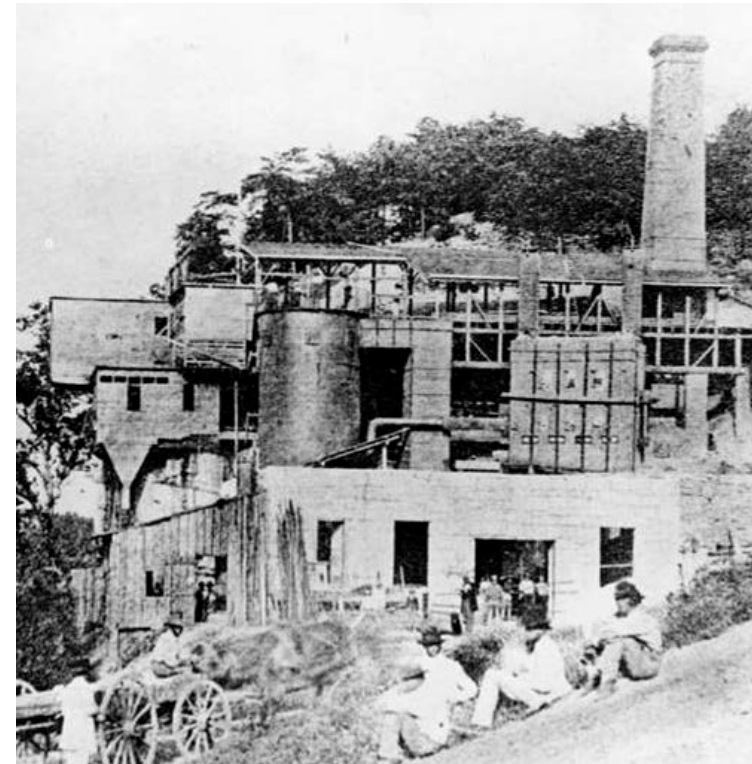






## Industrial Past

- Industrial hub late 1800s to mid-1900s
- Produced iron; products for steel, tanning, saddlery, automobile, appliance industries
- The Dynamo of Dixie





1969  
"Dirtiest City in  
America"

Worst air quality in U.S.







## The Early 1980s

- Loss of jobs; young people leaving
- Foreign competition in manufacturing
- A downtown in decline
- Service and tourism industry began to gather steam





- Since the 1980s, 20 U.S. cities lost more than 10 percent of their population in a single decade
  - Buffalo, Gary, Flint, Birmingham, New Orleans ...
- In 1990, Chattanooga made this **List of Losers**



## Downtown Housing

- 41-unit Riverset Apartments opens in 1993
- First downtown apartments constructed since mid-1970s

THE  
CHATTANOOGA

WAY









## Tennessee Riverwalk

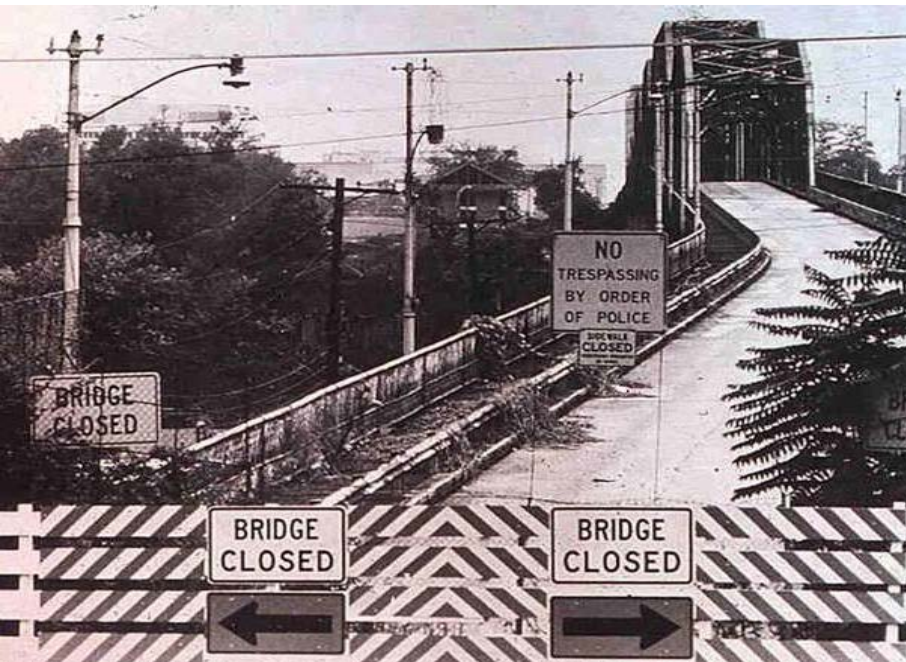
- 13-mile Riverwalk on north and south shores
- Riverwalk connects several new riverside parks





# Walnut Street Bridge

- 1978 – Closed to vehicular traffic
- Reopened in 1993
- Longest pedestrian bridge in world; one-half mile span























# PARADE



Across the nation, citizens with vision and a new community spirit are transforming once run-down urban areas—such as in Chattanooga, Tennessee—into exciting, people-friendly towns.

The Chattanooga back: Mayor Jon Kinney (lower right) with some of the citizens who helped revive their city.

## The Reborn American City A Place You Might Want To Live

A Report By Lamar Graham

INSIDE: What Is "Deen Play"? By Diane Ackerman





Manufactured in Chattanooga  
Advanced Vehicle Systems, Inc.

**CHATTANOOGA'S**

**CARTA**

Zero Emission

Electric Powered Bus



# Elements of Real Change



- Principles
- Process
- Design
- Partnerships
- Policy
- Technology
- Measurements

## Vision with Action



# Our Working Principles for Sustainability

## Place:

Our place is unique and the landscape has been a witness to the history that is part of shaping who we are. Our natural place nurtures our needs. We will value and protect it.

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## Triple Bottom Line:

With every decision, we will raise and sustain the quality of life for current and future generations by improving the economy, the environment and the community.

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## Resilience:

To be a sustainable city, we must be resilient in every aspect of our lives and the life of our city and region.

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## Innovation:

We will be innovators and partner with innovators in every aspect of our work

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## Zero:

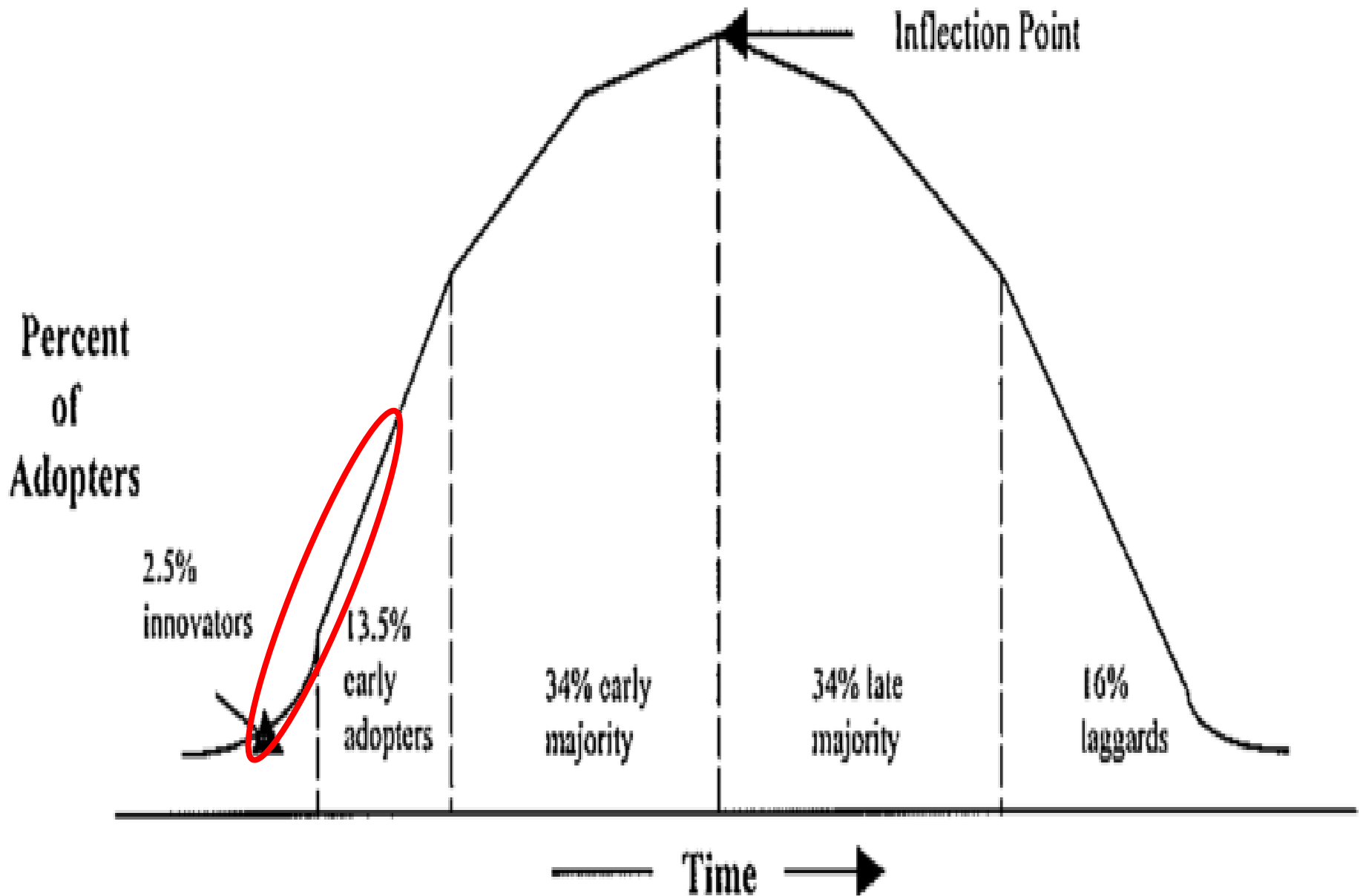
We will seek to eliminate the concept of waste; of human potential, natural capital and financial resources

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## Measurements:

We will set goals that are worthy of a smart and sustainable city. We will be transparent in measuring the attainment of those goals.

**Fig. 2 – Rogers' Model of Innovation Adoption**





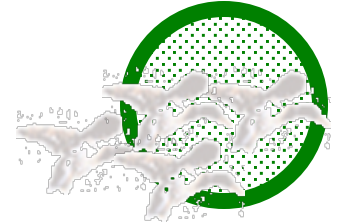
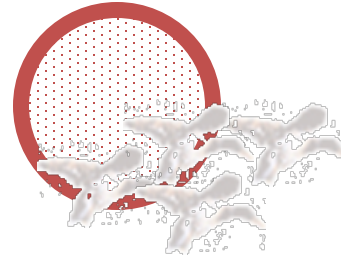
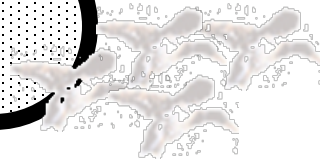
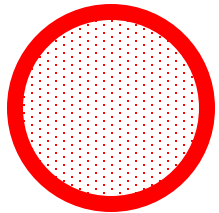
# ©Strategy / Project Evaluation

**Unsuccessful**

**Successful**

**Winning**

**Significant**



*Where do they want to go?*

*Where are they going next ?*

*Where are they now?*

*Where were they ?*

*“It’s Where You Aim...Not How Fast You Shoot”  
“You Have to Shoot Where They’re Gonna Be”*

# YOUR GIG IS HERE.

## Right here, in Chattanooga.

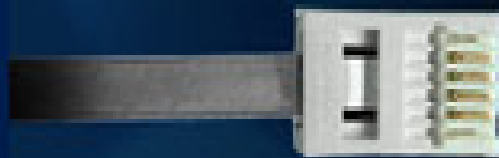
**CHATTANOOGA, TENNESSEE IS THE FIRST AND ONLY CITY IN AMERICA WITH A GIG.**

On September 13, 2010 - every business and home that is connected to Chattanooga's fiber optic network will have access to a 1 gigabit per second Internet connection. By the end of this year, this will be true of 170,000 businesses and homes in a 600 square mile service area.

1976 - 1999

### MODEM - DSL

.11 kbps to 12 Mbps



1997 - 2009

### CABLE

4 Mbps to 50 Mbps



NOW

### CHATTANOOGA FIBER OPTIC

1,000 Mbps = 1 Gig





# Chattanooga –it's a state of mind\*

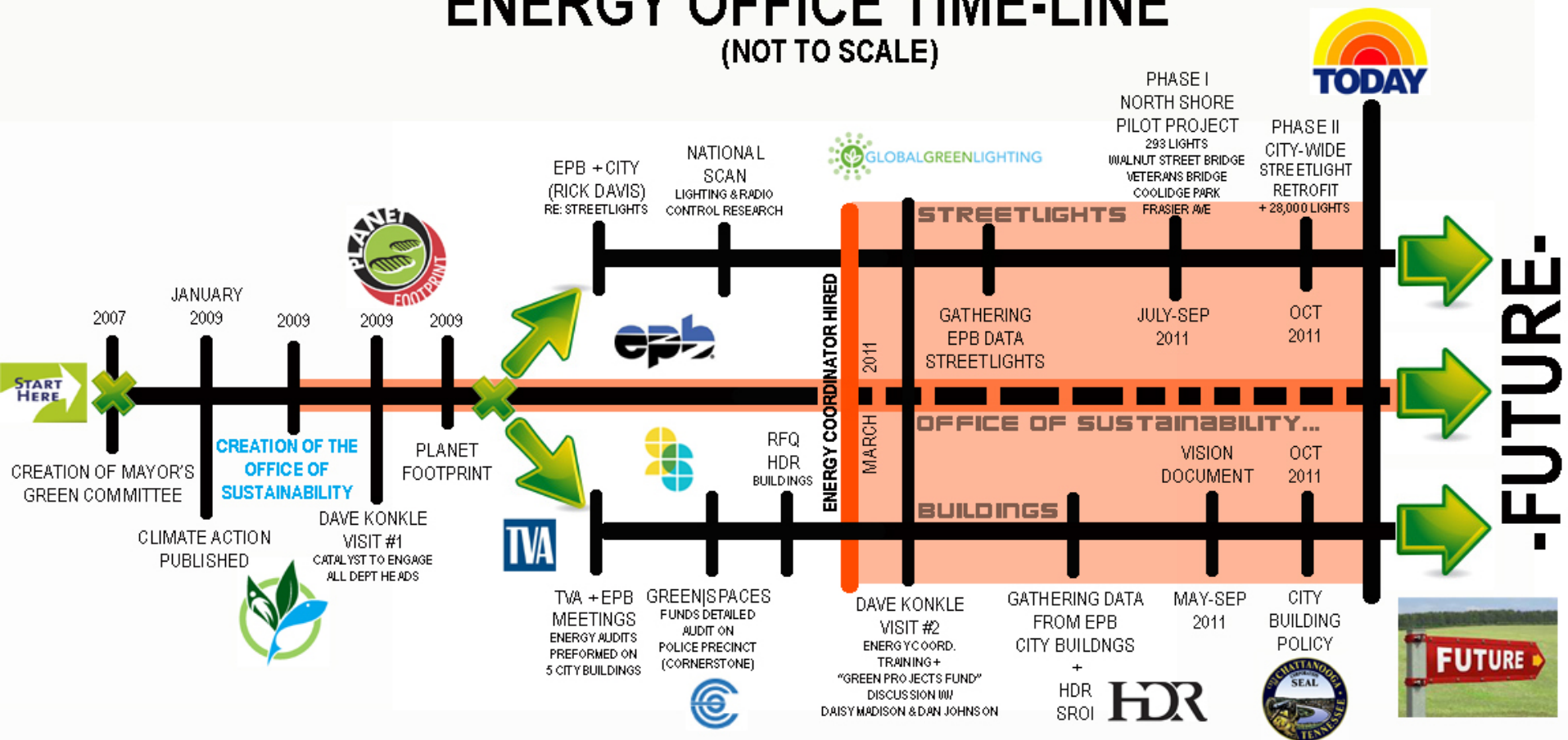
*A place of imagination and connections*



*Russian Entrepreneur to Russian President about Silicon Valley*

# ENERGY OFFICE TIME-LINE

(NOT TO SCALE)

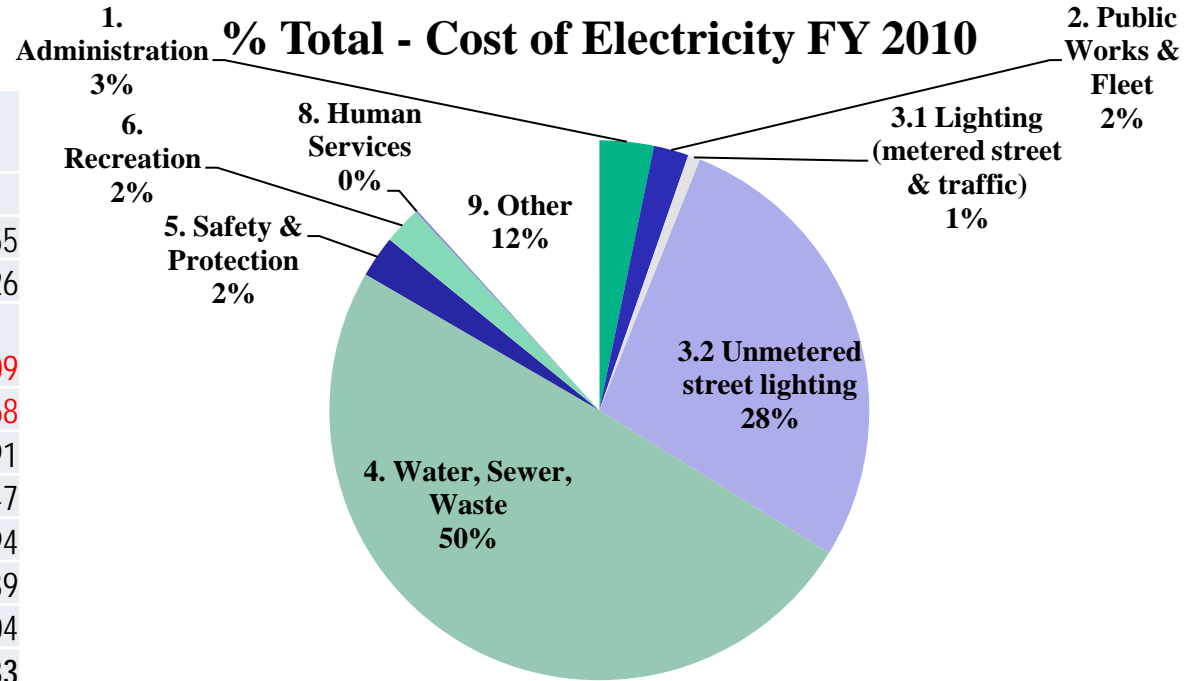


## Major Division 1

# Streetlights

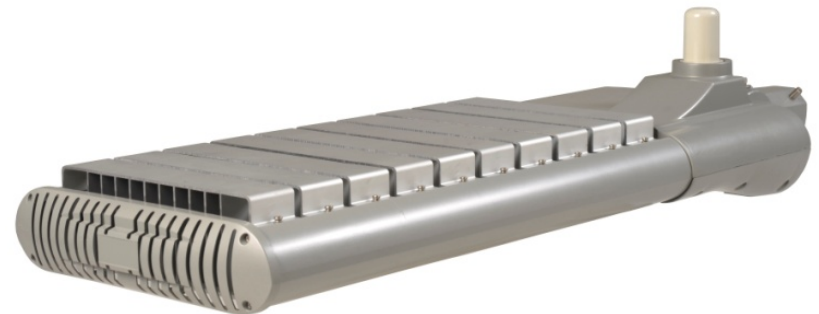
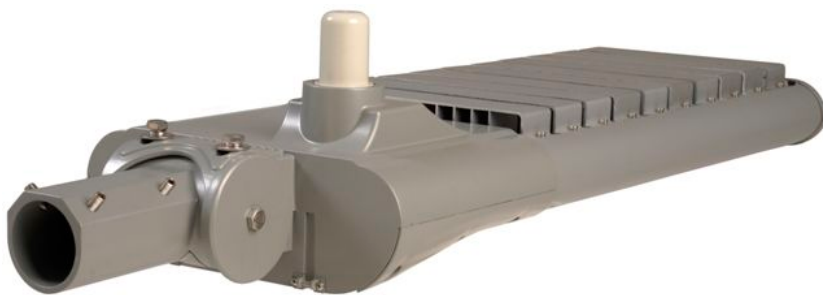
### Sum of FY 2010 Cost of Electricity

Asset Code	Total
1. Administration	349,856.55
2. Public Works & Fleet	224,312.26
3.1 Lighting (metered street & traffic)	78,307.09
3.2 Unmetered street lighting	2,988,610.68
4. Water, Sewer, Waste	5,328,757.91
5. Safety & Protection	269,444.47
6. Recreation	239,484.94
8. Human Services	14,850.39
9. Other	1,264,554.04
<b>Grand Total</b>	<b>10,758,178.33</b>

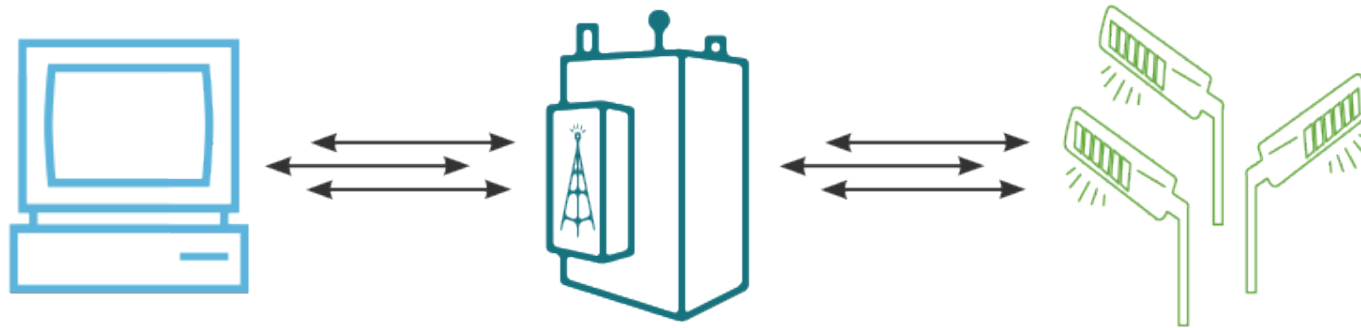




## LED and Induction Street Lights



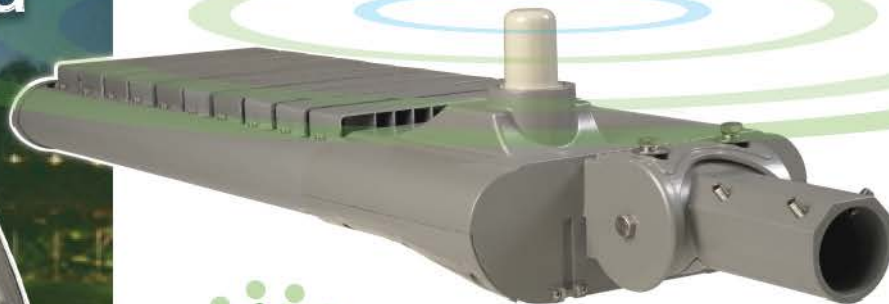
# The Future of Lighting



**GGL brings together high-efficiency LED and Induction lighting fixtures and cutting edge Smart Grid wireless lighting control technology to produce the world's smartest lighting system**



"The world's smartest lights  
are made in Chattanooga"



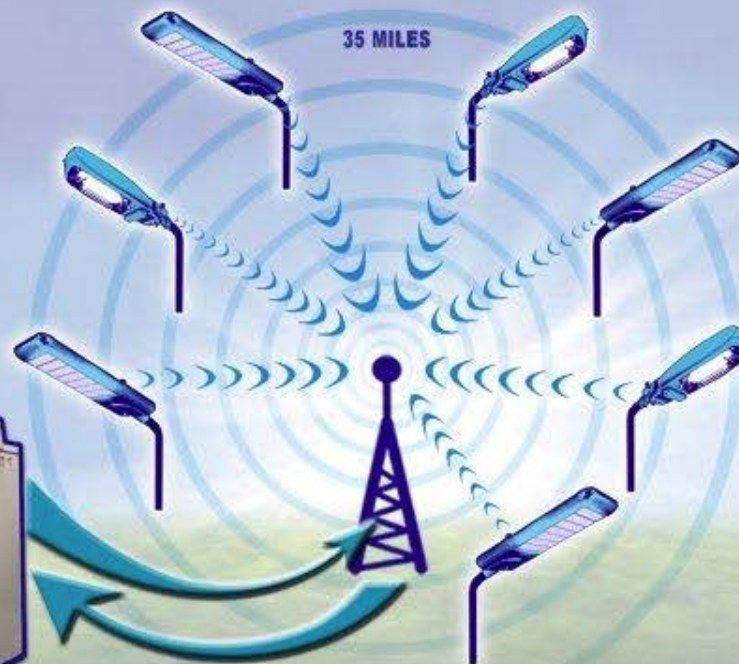
GLOBALGREENLIGHTING



HOMELAND SECURED  
CONTROL CENTER



POINT TO MULTI-POINT  
TWO WAY  
METRO TRANSMITTER



35 MILES





## Phase I: North Shore Pilot Project

- 293 Lights in Coolidge Park, Walnut Street Bridge, Veterans Bridge, and Frasier Avenue
- LED + Induction
- Point to Multi-Point Radio Controls

## Summary

EECBG Grant (OS)	\$211,000
City of Chatt	\$ 20,000
Hamilton Co.	<u>\$ 20,000</u>
<b>Total Project Cost</b>	<b>\$251,000</b>

(4.32 year payback)

**Total Annual Savings\* 87%**  
\*Includes Energy + Maintenance

## Phase II: City-Wide Lighting Retrofit

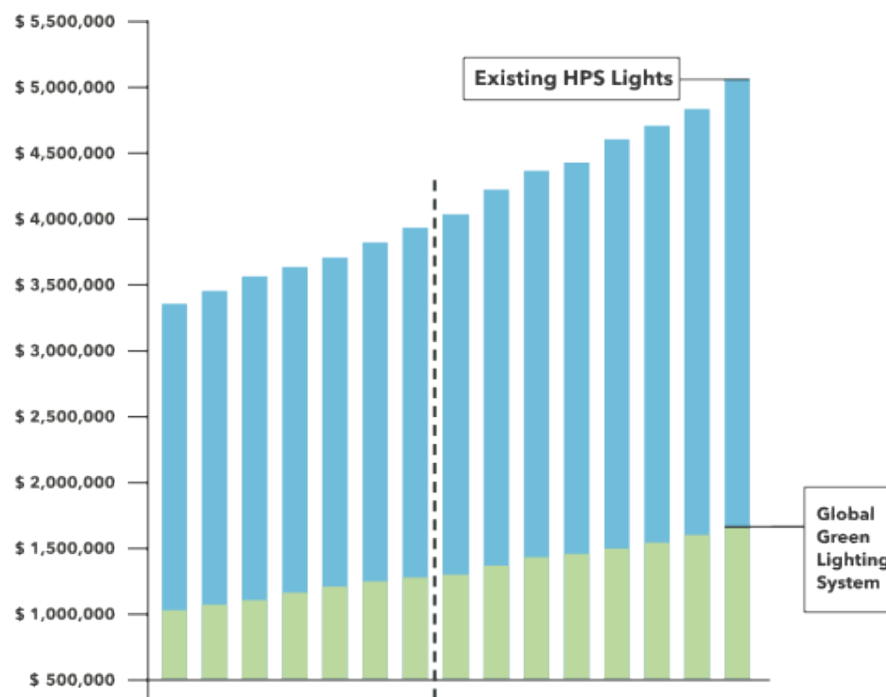
- + 28,000 Lights
- LED + Induction
- Point to Multi-Point Radio Controls



# Economic Benefits

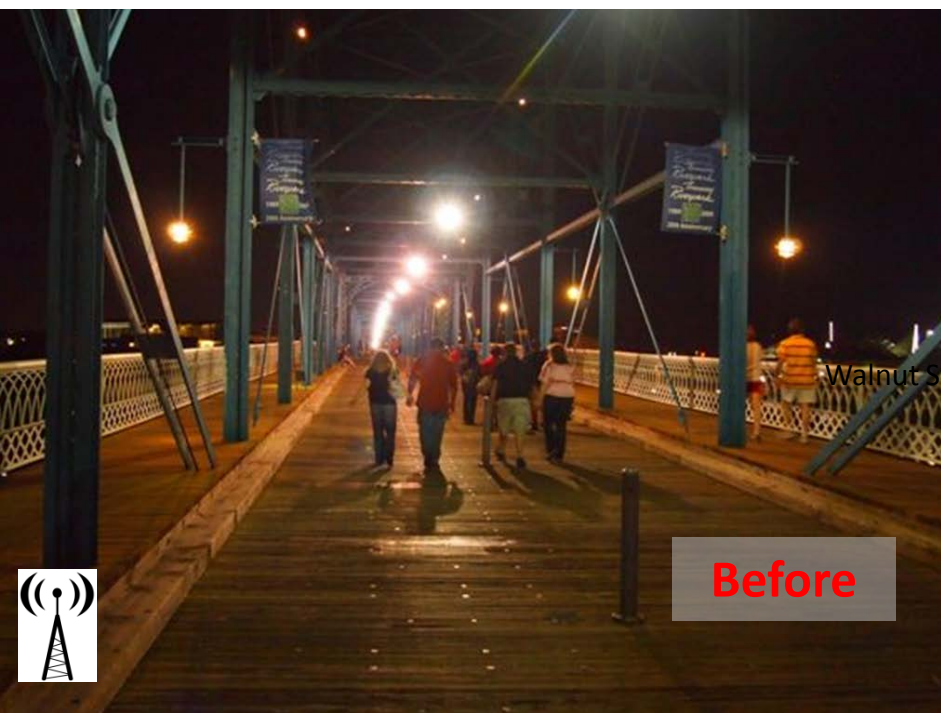
With average annual savings of over **\$2,750,000**, the system pays for itself within **7** years and provides ongoing environmental and community benefits at no charge.

Cost of lighting systems over 15 year period





**"The world's smartest lights are made in Chattanooga"**



Walnut Street Bridge

**Before**



**After**



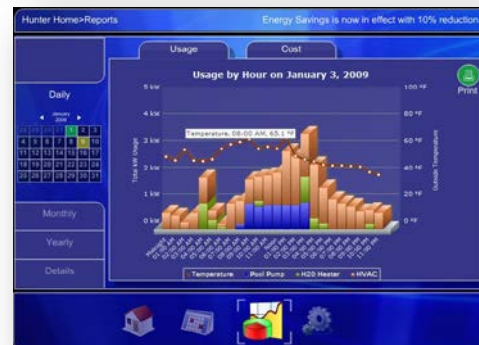
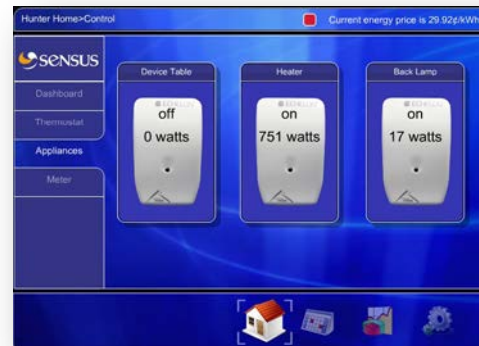
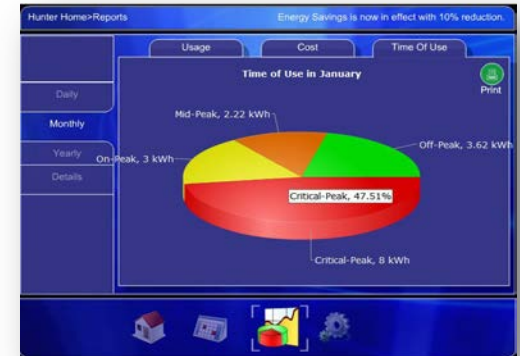




















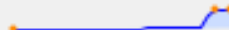









# Monitor and manage an entire City, from your computer desk top, notebook or hand held PDA

- Smart Grid apps/services platform
- Simple setup/configure wizards
- Utility selectable widgets
- 4-screen UI with mobile alerts
- Real-feel remote user-experience
- Contextual roll-over data
- On screen device control





Carbon Credits  
**-384**  
Since Jun 7, 2011

Week (Rolling 7 Days)				Month (Rolling 30 Days)			
	Avg.	Trend	Change	Total	Avg.	Trend	Change
	152		 63.61%	1,832	610		 100.00%
	161		 65.78%	1,937	645		 100.00%
4	477		 43.94%	5,733	1,911		 100.00%
kWh	3,613 kWh		 867.39%	43,353 kWh	14,451 kWh		 100.00%
kWh	2,895 kWh		 1851.36%	34,739 kWh	11,580 kWh		 100.00%
cc	32.00 cc		 1883.67%	384.00 cc	128.00 cc		 100.00%

Export:  CSV

 Map[➤ Create new Group](#)

- ☒ Active
- ☒ Alarm
- ☐ Deactivated
- ☐ Maintenance
- ☒ Warning

LIGHT TYPE

ADDRESS

## EVENT SCHEDULE

## OFFSET SCHEDULE

## CONFIGURATION

Select: [All](#), [Page](#) or [None](#)

☒ STATUS Alarm ☒ STATUS Warning ☒ STATUS Active [Reset Filters](#)

3,868 Matches  Save

first congregational church

3086

3065

3099

3022

3111

3101

3073

3120

3049

3058

3123

5th Ave

Map data ©2011 Google, Sanborn - Terms of Use

POWERED BY Google

# Radio Controlled LED

## Cost Savings vs. standard LED

- **Energy** up to **25%** more savings
  - Dim on command at a certain time
  - Turn off lights on command
- **Maintenance** **75%** savings
  - Eliminate photocell as point of failure
  - Dashboard view of status
  - Failure notification including part required
- **Longevity**
  - Extended life of power supply and light
  - No degradation



# Public Safety

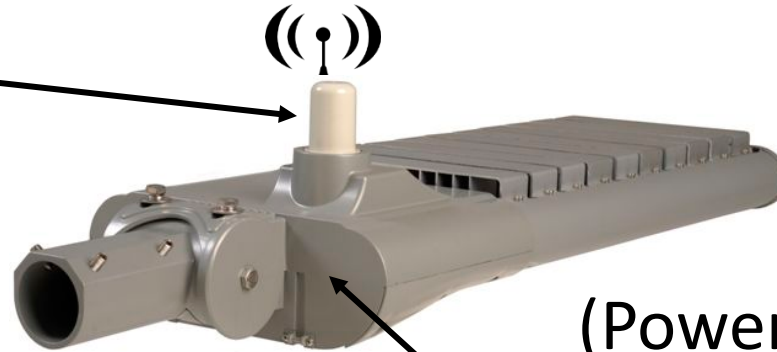
- Day or Night use of lights on command
- Raise light level on command for safety
- 911 light blinks in front of address
- All lights flash for tornado, nuclear, terrorist
- Lights can stream for evacuation routes

# Versatility

## Long Term Evolution



national or regional monitoring



POE  
(Power Over Ethernet)

GGL's POE provides a back haul to the Internet, via the Flexnet ( data only) WiFi, or Fiber Optics.



traffic



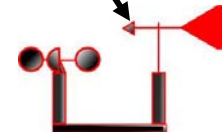
advertising



Camera



Air Quality



Weather



**"The world's smartest lights are made in Chattanooga"**



[http://www.youtube.com/watch?v=CcE\\_k6DjE3A](http://www.youtube.com/watch?v=CcE_k6DjE3A)

[http://www.youtube.com/watch?v=LOtoxJn\\_ZJw](http://www.youtube.com/watch?v=LOtoxJn_ZJw)